

## CLAIMS

What is claimed is:

1. An imaging system comprising:
  - 2 a focal plane array (FPA) having a plurality of pixels;
  - 3 a lens adapted to focus radiation from a scene in front of the lens onto the FPA
  - 4 behind the lens;
  - 5 a shutter located in front of the lens, the shutter having a closed state that produces
  - 6 a spatially uniform reference image signal and allows internal radiant flux
  - 7 of the system to reach detectors of the FPA, and an open state that allows an
  - 8 open state image signal that includes external scene radiation and internal
  - 9 radiant flux from the system to reach detectors of the FPA; and
  - 10 a signal processing module operatively coupled to the FPA, and adapted to correct
  - 11 the open state image signal based on the spatially uniform reference image
  - 12 signal.
1. 2. The system of claim 1 further comprising:
  - 2 a shutter controller operatively coupled to the shutter, and adapted to command the
  - 3 shutter to its opened and closed states.
1. 3. The system of claim 2 further comprising:
  - 2 a system controller communicatively coupled to the shutter controller and the
  - 3 signal processing module, and adapted to control operation of the imaging
  - 4 system.
1. 4. The system of claim 3 where the system controller is communicatively
- 2 coupled to a network thereby enabling the imaging system to communicate with other
- 3 systems also communicatively coupled to the network.
1. 5. The system of claim 1 further comprising:

2           a temperature controller adapted for illuminating the scene with radiation, thereby  
3           allowing reflected radiation to be received by the system.

1           6.       The system of claim 5 further wherein the temperature controller includes a  
2       laser for illuminating the scene.

1           7.       The system of claim 1 further wherein the shutter has a lens side surface  
2       that is located within five millimeters of the front of the lens.

1           8.       The system of claim 1 wherein for any one session of imaging system  
2       operation, each of a plurality of open state image signals are corrected based on the closed  
3       state image signal.

1           9.       The system of claim 1 wherein the closed state image signal is periodically  
2       generated to account for changes in the imaging system.

1           10.      A method for imaging a scene, where method is carried out by an imaging  
2       system configured with a front lens mounted shutter, the method comprising:  
3           closing the front lens mounted shutter so that external scenes are blocked from  
4       being imaged;  
5           generating a closed state image signal that includes internal radiant flux of the  
6       system;  
7           opening the front lens mounted shutter thereby allowing the imaging system to  
8       receive external scene radiation;  
9           generating an open state image signal based on the received scene radiation; and  
10          correcting the open state image signal based on the closed state image signal.

1           11.      The method of claims 10 wherein correcting the open state image signal  
2       includes compensating for pixel-to-pixel non-uniformities of a detector array included in  
3       the imaging system.

1           12. The method of claims 10 wherein correcting the open state image signal  
2 includes compensating for offsets between the opened and closed states of the lens.

1           13. The method of claims 10 wherein correcting the open state image signal  
2 includes compensating for pixel-to-pixel non-uniformities and offsets between the opened  
3 and closed states of the lens.

1           14. The method of claims 10 wherein the external scene radiation includes IR  
2 radiation and the imaging system includes an IR sensitive FPA for generating the closed  
3 and open state image signals.

1           15. A method for manufacturing an imaging system, the method comprising:  
2           providing a lens adapted to focus radiation from a scene in front of the lens onto a  
3           detector array behind the lens; and  
4           providing a shutter located in front of the lens, the shutter having a closed state that  
5           allows a closed state image signal that includes internal radiant flux of the  
6           system to be generated by the detector array, and an open state that allows  
7           an open state image signal that includes external scene radiation to be  
8           generated by the detector array.

1           16. The method of claim 15 further comprising:  
2           providing a detector array having a plurality of pixels for detecting scene radiation;  
3           and  
4           operatively coupling a signal processing module to the detector array, the signal  
5           processing module adapted to correct open state image signals based on  
6           closed state image signals.

1           17. The method of claim 16 further comprising:  
2           operatively coupling a shutter controller to the shutter, the shutter controller  
3           adapted to command the shutter to its opened and closed states.

1        18. The method of claim 17 further comprising:  
2              operatively coupling a system controller to the shutter controller and processing  
3              module, the system controller adapted to control operation of the imaging  
4              system.

1        19. The method of claim 15 further comprising:  
2              providing a laser adapted to illuminate a scene with radiation, thereby allowing  
3              reflected radiation to be received by the system.

1        20. The method of claim 15 further wherein the shutter has a lens side surface  
2              that is located within five millimeters of the front of the lens.